IMPROVEMENTS IN PHYSICIAN PRODUCTIVITY

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1.0 INTRODUCTION

1.1 The Productivity Offset to the Medicare Economic Index

Payment under Medicare Part B for a physician's service is based on a reasonable charge which may not exceed the lowest of: (1) the physician's actual charge for the service; (2) his or her customary charge for that service; or (3) the prevailing charges of physicians for similar services in the locality. The unadjusted prevailing charge for a service is calculated as the 75th percentile of physicians' customary charges. However, since 1973 the rate of increase in prevailing charges has been constrained by the rate of increase in the Medicare Economic Index (MEI).

The MEI has two components: one measuring changes in general earnings levels and the other measuring changes in physicians' practice cost expenses. The components are combined 60 percent and 40 percent, respectively, to reflect the shares of physician net income and practice expenses in physician gross revenue. General earnings levels are measured by the average weekly earnings of production and nonsupervisory workers collected by the Bureau of Labor Statistics (BLS). Changes in practice costs are not measured by changes in observed total costs, but by various government consumer, producer, and other price indices appropriate for the inputs that physicians purchase.

The rate of growth of general earnings is debited by the rate of change in worker productivity, measured by the BLS index of output per man-hour of employed nonfarm workers. The rationale for subtracting productivity is that the physician, in his role as entrepreneur, appropriates productivity gains as increased revenues, so updating his implicit wage by the change in earnings, which incorporates productivity gains, would constitute double counting. Stated another way, gains in productivity enable the physician to produce services at a faster rate. Under Medicare's fee-for-service (FFS) reimbursement method, the physician increases his revenues by providing more services. He should not also be compensated for productivity improvements by higher per-service fees.

In fact, in a competitive market, cost-reducing productivity improvements would be reflected in lower prices. The current MEI productivity offset only avoids double-counting in the physician component. It does not roll back fees to reflect lower costs possible through productivity gains, thus unnecessarily increasing program expenditures and sheltering inefficient physicians. A second limitation of the current adjustment is that it is economy-wide, not specific to physicians, or even the medical sector. If physician productivity is changing at a different rate than economy-wide productivity, the MEI productivity debit is inaccurate.

The MEI productivity offset could be improved by consideration of physician-specific cost reductions, but only a particular type of physician productivity gain should be incorporated. As a general concept, greater productivity means that a higher rate of output is achieved for given levels of inputs. Physician output may be defined in different ways, leading to different concepts of productivity. Improvements in health status are the ultimate output, but Medicare does not pay physicians on that basis. Nor are they paid for the comprehensive care of patients, or based on episode of illness. Since Medicare pays physicians on a FFS basis, only productivity improvements which reduce the cost of providing specific procedures or visits which are the units of payment should be incorporated in the MEI update.

Productivity improvements which result in fewer visits, or a shift to a less costly mix of procedures, are automatically captured by FFS payment. For example, if physicians are more productive in improving the population health status through more effective preventive care, Medicare payments will fall to reflect the lower amount of medical services required. Similarly, if fewer visits over an episode of illness are required for treatment, this will be reflected in lower Medicare payments. Finally, shifts to less costly procedures (e.g., arthroscopic knee surgery versus traditional knee surgery, or outpatient versus inpatient surgery) will be captured through lower payments for the less costly procedure. On the other hand, if physicians become more productive in performing a given procedure over time, that should be reflected in the MEI productivity offset.

1.2 Overview of the Report

The purpose of this report is to document actual and potential improvements in physician productivity. These can be used as a basis for refinement of the productivity offset to the MEI. For the reasons given above, we focus on productivity improvements which increase the rate of performance or reduce the cost of specific procedures or visits, not on changes in procedure mix, hospital inpatient/outpatient shifts, and improvements in health status.

Section 2 documents actual and potential productivity improvements possible through: (1) increased delegation of tasks to nonphysician aides; (2) formation of group practices; and (3) technological advances or learning curve effects which reduce physician time required to perform procedures. Many specific examples are given.

Section 3 describes the range of actual physician productivity, then analyzes how much average productivity could be raised if low-productivity physicians improved their productivity. In addition, the area and practice characteristics of low-productivity versus high-productivity physicians are identified.

Section 4 discusses the implications of the large increases in physician supply for Medicare FFS prices. Although this analysis does not concern productivity, it is directly relevant to updating Medicare fees. It is argued that, in a competitive market, supply growing faster than demand would lead to lower prices. HCFA would be justified in simulating the competitive market by raising Medicare fees at less than the rate of cost inflation.

2.0 ACTUAL AND POTENTIAL IMPROVEMENTS IN PHYSICIAN PRODUCTIVITY

2.1 Introduction

Physician output of services, S, depends on inputs of physician time, P, nonphysician labor time, T, and capital inputs, K:

$$S = f(P, T, K). \qquad (1)$$

Physician productivity, or the rate of output per physician time, S/P, can be increased through greater inputs of nonphysician labor and/or capital inputs, through organizational or technological improvements which permit more services to be provided with fewer inputs, through higher-quality labor or capital inputs, or through greater efficiency.

Research has shown that, at least in the office setting, capital inputs are mostly of a complementary rather than a substitutable nature for physician time. Greater capital inputs tend to allow provision of new services and are often cost-increasing (Reinhardt, 1975). Labor inputs, on the other hand, are much more substitutable and increased delegation of tasks to nonphysician aides can greatly increase productivity. Section 2.2 surveys the literature on productivity improvements possible through use of nonphysician aides.

The major organizational factor which has been shown to allow productivity improvements is formation of group practices. Section 2.3 discusses productivity gains from this source.

Section 2.4 turns to productivity improvements due to technological advances, and through learning curve effects which increase the quality, or productivity, of the physician time input.

The potential for increased productivity through greater efficiency is discussed in Chapter 3.0.

2.2 Delegation to Nonphysician Aides

The operation of a physician's practice involves the performance of many tasks, ranging from clerical to laboratory to clinical. The physician can delegate many of these tasks to nonphysician aides, freeing his own time for those tasks which require his expertise. Through delegation, the physician can greatly increase the amount of services provided by his practice

for a given amount of his own time. Since the physician's time is more valuable and costly than that of his aides, this productivity improvement reduces costs. Medicare should be able to share in the cost reduction through lower fees for visits or procedures which are more efficiently produced. However, a productivity offset to the MEI for increased task delegation is only justified if physicians are not currently using an efficient level of aides.

The types of aides physicians employ in their offices may be generically classified as (1) highly-trained physician extenders such as physicians' assistants and nurse practitioners, (2) medical workers such as registered nurses, licensed practical nurses, and technicians, and (3) clerical workers such as secretaries, bookkeepers and the like. Because of their advanced medical training, physician extenders are most substitutable for physicians. Nurses, technicians, and clerical personnel are less substitutable, yet delegation to them relieves the physician of many mundane tasks and can increase his productivity.

The possibilities for delegation are determined by both technical and economic substitution possibilities. Technical substitution is possible if a nonphysician aide can perform a task currently performed by a physician. Technical substitution is most possible for simple tasks requiring less training, and less feasible for highly-skilled tasks requiring the physician's greater expertise. Economic substitution possibilities are determined by the relative costs of the physician and a nonphysician aide in performing a task. Relative costliness depends on both the cost per hour of different providers and their productivity in performing the task (i.e., how long it takes them to complete it). A physician may be three times as productive as his aide in a task, but if the aide is one-sixth as expensive, it costs less to have the aide do the task.

This section reviews the extensive literature on productivity improvements possible through use of nonphysician aides, especially physician extenders. Findings on economic substitution possibilities and whether physicians are using an efficient number of aides are also reviewed, although they are considerably less numerous. Most of the literature, and therefore most of the section, focuses on the office setting. However, we conclude with a specific case study of task delegation in the provision of anesthesia. Some additional comments on delegation in the surgical and hospital settings are made in Section 2.4.

2.2.1 Technical Substitution Possibilities and Potential Productivity Gains

A number of studies have documented the substitution possibilities between physician extenders and physicians, and the productivity gains possible through use of physician extenders. Most have found that substantial productivity gains are possible through increased delegation, although estimates of the magnitude of the gains vary widely depending on the particular setting analyzed. Possibilities for delegation in primary care medicine and large group practices are especially great.

In a review of 15 studies that used physician office visits as a measure of delegability, Record (1979) concluded that between 75 and 80 percent of adult primary care services and up to 90 percent of pediatric primary care services could be delegated to physician extenders. Rabin and Spector (1980) found that 92 percent of primary care activities could be delegated to some sort of new health practitioner. Zeckhauser and Eliastam (1974) concluded that a physician assistant could replace half of a full-time physician in an urban health center. The Burlington Randomized Trial of the Nurse Practitioner Study found that nurse practitioners were able to provide primary care services as safely and effectively as physicians. In 76 percent of patient visits, care was provided with no physician consultation (Sackett et al., 1974; and Spitzer et al., 1974). Greenfield et al. (1978) found that physician time required for consultation with nurse practitioners when cases were delegated was 92 percent less than the time that physicians would spend treating the same clinical problem.

The extensive use of physician extenders by some HMOs also indicates large substitution possibilities. In the Columbia Medical Plan HMO, in 1971-2, 79 percent of patient encounters in adult medicine were managed initially by physicians (Steinwachs et al., 1976). By 1973-4, that figure had dropped to 38 percent. In 1971-2, physician extenders managed 10 percent of initial encounters for illness and injury and conducted no health reviews. By 1973-4, physician extenders managed 50 percent of illness and 75 percent of initial injury encounters and conducted 50 percent of adult health reviews. Over the three year study period, physicians as a proportion of total FTEs fell from 60 to 38 percent. In the Northern California Kaiser-Permanente Medical Care Program HMO, nurse practitioners conducted a Health Evaluation

Service (HES). Of the patients who entered the Kaiser system through HES, 74 percent were managed without physician referral (Feldman et al., 1977). Of those referred to a physician, two-thirds went to a specialty clinic, thus having the nurse practitioner's HES visit substitute for an initial primary care physician visit. In a mathematical model for HMO staffing patterns, Schneider and Foley (1977) estimated that the substitution of one physician extender would decrease required physician time by 53 to 60 percent depending on department.

Estimates of increases in the productivity of physician practices using physician extenders range from 20 to 90 percent (Office of Technology Assessment, 1986). LeRoy (1980) reported increases of between 20 and 90 percent in the productivity of physicians' practices that added nurse practitioners. Hershey and Kropp (1979) estimated that the net productivity gain from nurse practitioners is 20 percent. Using a relative value scale to capture visit content, Holmes et al. (1977) found that productivity levels in practices incorporating nurse practitioners to an average 25.8 percent higher than traditional physician/nurse practices. Holmes et al. (1976) found that a nurse clinician, physician, and nurse were able to manage 31 percent more patient visits in a primary care practice during a standard day than a physician and nurse. Using activity analysis Golladay, Smith, and Miller (1972) estimated that a physician assistant increases a primary care physician's productivity by 49 to 74 percent. Pondy (1971) reached similar conclusions. Kehrer and Zaretsky (1972) estimate that a doubling of allied health personnel input would increase total patient visits per physician by 20 to 25 percent.

Most of the literature has considered the productivity potential of highly-trained physician extenders. However, aides such as nurses and secretaries also increase productivity. In his classic study of physician productivity, Reinhardt (1975) considers only "traditional allied health manpower" such as RNs, medical technicians, and office aides. Nevertheless, he concludes that if the number of aides were doubled (from about 2 per physician to about 4) weekly physician productivity would increase from 25 percent up to 55 percent depending on specialty.

2.2.2 Cost Savings from Task Delegation and Economic Substitution

Productivity improvements through task delegation can substantially lower the cost of providing medical services, making aides economically as well as technically substitutable for physician time. Record (1979) estimated potential cost savings of $0.5 to over $1 billion dollars through greater task delegation in primary care. This amounted to 19 to 49 percent of total primary care provider costs. Denton et al. (1983) concluded that the savings from the widespread use of physician extenders would be from 10 to 15 percent of all Canadian medical costs (or from $300 million to $450 million) and that the savings would be between 16 and 24 percent of total ambulatory care costs. Office of Technology Assessment (1986) contains illustrative computations indicating that employment of physician extenders is profitable to physicians and reduces costs. Salkever et al. (1982) found that treatment of otitis media and sore throat by nurse practitioners was less expensive than treatment by physicians. Based on his production function estimates, Reinhardt (1972, 1975) finds that the marginal revenue from hiring additional aides exceeds their marginal cost. Schiff, Frazer, and Walters (1969) and Yankauer et al. (1972) indicate that it is profitable to the physician to hire pediatric nurse practitioners. Scheffler and Stinson (1972) reach the same conclusion with regard to physician assistants. Golladay et al. (1973) find task delegation to be profitable to the physician.

Although physician extenders tend to be less productive than physicians (OTA, 1986), they are cost effective because of the much lower cost of their time than a physician's time. In 1983, annual salaries for physician extenders averaged about $25,000, compared with $60,000 to $80,000 median salaries for primary care physicians. Using 1975 data, CBO (1979) determined that the median hourly wage for physician extenders was about $6 as compared with $24 for physicians.

2.2.3 Do Physicians Use an Efficient Number of Aides?

If physicians are currently using an inefficient number of aides, then costs can be further reduced through more task delegation. Determining efficiency in the use of aides is empirically difficult and consequently the

evidence on this issue is limited and sometimes contradictory. Reinhardt's (1975) study is the seminal work in this field. He concludes that the average solo practitioner could profitably employ twice as many traditional auxilaries as he currently does. However, Brown and Lapan (1981) find that, on average, physicians use aides efficiently. Moreover, Hershey and Kropp (1979) argue that earlier studies overstated the productivity gains possible through delegation and that physicians gain little through use of more aides. Other studies have argued that physicians resist hiring aides even when that would be more efficient (Fottler, Gibson, Pinchoff, 1980; Cherkin, 1980) and that physician extenders could adequately perform many more tasks than they currently do, but are restricted by licensure laws, lack of third party reimbursement, unavailability of malpractice insurance, and physician/patient ignorance (OTA, 1986; Abdellah, 1982).

2.2.4 A Specific Example: Task Delegation in the Provision of Anesthesia

Most of the literature, and the preceeding analysis, has been conducted for the office setting. However, task delegation to improve productivity and reduce costs is also feasible in the hospital setting. Technicians can substitute for pathologists and radiologists, surgical assistants for surgeons, residents for physicians, and so forth. A particularly graphic and important example of substitution possibilities occurs in the provision of anesthesia services. This section discusses substitution between anesthesiologists and Certified Registered Nurse Anesthetists (CRNAs) in some detail.

There are currently over 20,000 anesthesiologists providing anesthesia in the United States, and Medicare, alone, spends over $1 billion annually on their services. But unlike surgeons, who lack any close substitutes in the operating room, anesthesiologists often delegate their tasks to a CRNA. In fact, more CRNAs are involved in surgery than anesthesiologists, and they often work alone with the surgeon without anesthesiologist supervision.

Either working alone or under anesthesiologist supervision, CRNAs evaluate patient risk factors, insert arterial lies, administer general anesthesia and regional blocks, and monitor the patient both during and after the operation. CRNAs can be found in large and small hospitals, with and without a teaching affiliation, in all areas of the country.

Moreover, a recent HCFA-sponsored survey of anesthesia providers found no difference in the operative casemix of anesthesiologists working alone or in a supervisory capacity with CRNAs (Rosenbach and Cromwell, 1987). Anesthesiologists CRNA teams perform hysterectomies, hip replacements, even open heart surgery, at rates identical to anesthesiologists working alone, with no difference in patient outcomes. And according to their own self-reports, anesthesiologists delegate many tasks to CRNAs during even the most complicated operations.

Unfortunately, however, many anesthesiologists out of personal preference choose not to practice as a team, and this seriously affects their productivity. Working alone, they report that they perform roughly 1,000 operations per year compared to 1,350 when supervising CRNAS (Rosenbach and Cromwell, 1987). Given that solo and team anesthesiologists work the same number of hours in the operating room, this amounts to a 33 percent productivity loss through a failure to delegate.

The economic loss to society in general and the Medicare program in particular is substantial. The average surgery takes roughly 1 1/2 hours from beginning of anesthesia induction through emergence. The anesthesiologist working alone, by producing a third less operations per hour in the operating room, supplies the equivalent of 525 fewer hours of anesthesia per year compared to his more productive colleague. At an imputed hourly rate of $52 for his time, the value of this productivity loss is over $27,000 a year. As one-quarter of all anesthesiologists currently work alone (Rosenbach and Cromwell, 1987), the total productivity loss to society is over $135 million a year ($27,000 times 5,000 anesthesiologists).

The ability of well-trained, experienced CRNAs to assist in the full range of anesthesia tasks gives anesthesiologists the unique opportunity to raise their productivity from teamwork. That so many do not imposes a significant economic burden on society and the Medicare program. Changes in reimbursement arrangements could encourage greater delegation to CRNAs, enhance physician productivity, and eventually conserve on one of the most expensive human resources in America.

2.2.5 Summary

The literature clearly indicates that many of the tasks performed in a primary care physician's office practice can be delegated to nonphysician

aides, and that this will significantly increase the physician's productivity. The weight of the evidence also implies that costs can be substantially reduced through delegation and that more delegation than is currently practiced would be efficient. Greater task delegation by anasthesiologists to CRNAs provides a corresponding operating room example of how substantial productivity improvements and cost reductions can be achieved through delegation. For these reasons, a productivity offset to the MEI for reduced costs through more efficient task delegation appears to be justified.

2.3 Formation of Group Practices

Much research has been devoted to determining the affects of practice arrangements on physician productivity. Formation of group practices has been identified as a major potential source of increased hourly productivity. Group practice increases physician productivity through economies of scale, which may exist for several reasons. The most important are that larger scale allows greater specialization and hence efficiency, and that some inputs, either machines or aides, are indivisible and require large patient loads to be fully utilized.

Empirical studies have found higher productivity in group practices, although with diseconomies of scale for large groups. Using 1984 HCFA-NORC physician survey data, Hurdle and Pope (1987) found significantly higher primary-care physician visit productity in group practices. Holding constant physician time, practice inputs, other practice characteristics, and physician and area characteristics , physicians in groups of 2-4 completed 13 percent more total visits per year than solos, physicians in goups of 5-9 22 percent more visits, and physicians in larger groups 12 percent more visits. Using a deflated revenues output measure, physicians in group of 2-4 produced 6 percent more output than solos; physicians in groups of 5-9, 20 percent more output, but physicians in groups of 10 or more were equally productive. Using the 1976 HCFA-NORC physician survey, Brown and Lapan (1981) conclude that, ceteris paribus, physicians practicing in groups produce 18.3 percent more visits than solo doctors. Roos (1980) and Kimbell and Lorant (1977) find that physicians in small groups are more productive than solos, but that large groups are less productive. Reinhardt and Yett (1972) estimate production functions relating patient visits per week to practice inputs such as personnel, equiment, supplies, and physician time. They find that physicians

in single specialty partnerships or groups process 4 to 13 percent more patient visits per week than do solo practitioners, holding other practice inputs constant. Luft (1981) synthesizes the earlier literature on group size and productivity. He sees small group physicians to be more productive than solos, although large groups suffer from diseconomies of scale.

The average number of physicians per practice is increasing. In 1975, 54.2 percent of physicians (excluding those employed by hospitals and government agencies) were solo practitioners. By 1983, the share of physicians in solo practice had declined to 48.9 percent (AMA, 1984). The trend towards group practice should increase productivity and reduce costs. Medicare could capture the increased efficiency through a larger productivity offset to the MEI. Through reduced payments, Medicare can speed the consolidation of inefficiently small practices into larger units.

2.4 Technological Advances

Advances in medical technology affect physician productivity in a number of ways. Sometimes new technologies replace older, more time-consuming ones, enhancing the rate of physician output. More often, new technologies result in the provision of additional services that require more physician time, but that improve patient outcomes. These latter technologies lead to decreases in observed physician visit productivity (see Hurdle and Pope, 1987).

Medicare's pricing policies for these new services are designed both to reward providers for the time and effort involved, and to reflect the societal value of the new service. However, Medicare payment policies do not account for the more subtle productivity increases stemming from further technological refinements or "learning by doing" occuring at the procedure or service level. Although such increases are not necessarily apparent in productivity trends at the physician level, a growing literature suggests that this source of productivity gain is substantial and should be reflected in Medicare payment policies.

In this section, we first describe the failure of Medicare's pricing policies to account for such technological productivity gains and the resulting consequences. We then review the literature to document the existence and extensiveness of such productivity gains.

2.4.1 Medicare's Payment Policies

Once it has been decided that Medicare will cover a new technology, it is up to each individual carrier to determine an approved charge for the procedure without any historical Medicare data. Carriers use a variety of methods to determine allowed charges in an attempt to accomplish what occurs automatically in a competitive market. Namely, they try to obtain charges that reflect the time and effort (i.e. the costs) involved for the physician, in addition to the social value of the service. Generally, carriers negotiate with physicians performing the new technology to obtain an allowed charge that more or less reflects these considerations (see Power, et al., 1986). Market conditions have even less to do with changes in Medicare allowed charges. Once established, they are rigid downward. Consequently, any productivity gains resulting from further improvements in the provision of the service are not reflected in the current reimbursement methodology.

However, new services have the greatest potential for productivity gains. Technological refinements, diffusion of the technology, and the routinization of the service can result in substantial "within service" productivity gains. "Learning-by-doing" on the part of physicians, for example, can decrease the time, complexity, and risk originally involved in performing the procedure or service. If allowed charges do not decrease to reflect less effort involved, large profit margins are created for those services which experience technological and "learning curve" gains. This phenomenon has been noted for an increasing number of services such as coronary artery bypass grafts (CABGs), cataract surgery, pacemaker implants, electrocardiographs, and x-rays (see Blumberg, 1979).

Not only do high profit margins for certain services cost the Medicare program more, they provide incentives for physicians to provide these services rather than less lucrative ones. Many analysts cite the current payment system, which reimburses diagnostic and therapeutic procedures more generously relative to costs than it does visits, to explain the observed bias towards procedural versus non-procedural care (see CBO, 1986; Gore, et al., 1987; Showstack and Schroeder, 1978). Such perverse financial incentives could potentially result in greater use of profitable technologies with inferior outcomes over less expensive, more effective technologies. For example there

is anecdotal evidence suggesting that in many cases, angioplasty may be a more effective (not to mention cheaper) treatment of heart disease than CABG, given the risk of recurring blockages with the bypass surgery. Furthermore, there appears to be no difference in life span between the two treatments (see Boston Globe, 1986).

2.4.2 Productivity Gains at the Procedure Level

As a new procedure becomes routinized, procedure-specific productivity increases stem from three main sources: (1) technological refinements; (2) enhanced physician training and experience; and (3) increased ability to delegate components of the service or procedure. A growing literature is documenting such productivity decreases on a procedure by procedure basis.

Technological Refinements

Technological refinements of a new service or procedure can either increase or decrease physician time requirements. However, if time requirements are increased by the refinement, there is usually a decrease in the complexity or risk of the procedure such that physician effort is diminished overall. For example, technological refinements associated with bypass surgery (e.g. sequential vein grafting techniques, blood conservation techniques and effective pharmacologic hypothermic cardioplegia), greatly reduced the risks of the treatment, if not physician time (see Mitchell, et al., 1987).

An even newer technology being used to treat kidney stones, extracorporeal shock wave lithotripsy (ESWL), has been documented to take less than half the time of comparable surgical procedures (see Riehle, et al., 1986 and Preminger, et al., 1985), although it is currently being paid at the same level as surgeries in some regions (see Powers, et al., 1986). Currently, advertisements for new and improved lithotripters boast enhanced efficiency and cost effectiveness. For example, Dornier Medical Systems (the only manufacturer of U.S. approved lithotripters according to Powers, et al., 1986) is currently advertising a new lithtripter that allows faster patient handling and anesthesia-free treatment. In addition, they claim that a computer-controlled guidance system will increase the accuracy of the operator

in focusing on stones (see Federation of American Health Systems Review, 1987 p. 8). Such refinements in the technology reduce the time and the complexity of the procedure for the physician.

Another relatively new service that has benefited from continuing technological advances is cataract treatment. This treatment has been revolutionized in recent years by improved diagnostic techniques for examining the retina, operating microscopes, lasers, and the development of intraocular lenses (see Federal Register, 1986). These innovations have lowered the risks and increased the effectiveness of the surgery, allowing it to be performed on an outpatient versus inpatient basis and minimizing provider effort.

Increased Physician Training and Experience

In addition to productivity gains resulting from technological refinements, tremendous gains can be realized simply from the increased physician expertise and training that develops as the service becomes routinized. Productivity gains of this nature can be realized more for some types of procedures than others. For example, gastroenterologists who are specifically trained to perform endoscopies report shorter times for performing certain types (e.g. sigmoidoscopies and colonoscopies beyond the splenic flexure) than general or family practitioners or general surgeons who perform these procedures less frequently (see Cromwell, et al., 1987).

Technological advances in cataract treatment were followed by productivity gains from increased expertise on the part of ophthalmologists in performing cataract extractions and lens implants (see Gottlober, et al.,1986). Average times for cataract extraction fell from 62 to 48 minutes between 1980 and 1985 while extractions with IOL implants decreased from 51 to 45 minutes (see Federal Register, 1986). Extracting cataracts and implanting lenses in a single operation rather than two separate ones was in itself a big time saver, since lens insertion adds only 5 minutes to surgery time.

CABG also lends itself to learning curve gains. Mitchell et al. (1987) have cited the greater experience of surgeons and surgical teams and enhanced training of new cardiothoracic surgeons and support personnel to explain a 40 percent decrease in operating times since CABGs were first performed in the early 1970s. Controlling for the trend toward more complicated operations on an older Medicare population, the same study estimates a 23 percent increase in productivity between 1978 and 1984.

Nuclear magnetic resonance imaging may be another technology that lends itself to productivity gains from increased training. A 1984 report on this technology (see Steinberg and Cohen, 1984) cautions that in the near future more professional time (on the part of neurologists) will be required for magnetic resonance imaging than for CAT scans. However, as recently as 1986, data from a physician survey on procedure times for these two comparable procedures showed that neurologists take almost the same amount of time for magnetic resonance imaging as for CAT scans without contrast (16 minutes versus 14, respectively) and that magnetic resonance imaging takes much less time than CAT scans with and without contrast (see Cromwell et al., 1987).

Increased Delegation and Specialization

Increased experience with a new service can also lead to productivity enhancing divisions of labor and delegation. Since the CABG was first introduced, the role of the primary surgeon has changed dramatically. Early on, the primary surgeon was present and immediately responsible "from skin to skin" during the operation. However, as the technology has become more standardized and safer, residents, assistant surgeons, and even technicians are relied on to perform certain tasks (see Mitchell, et al., 1987).

Routinization of tasks involved in cataract surgery and lens implants also lends itself to task delegation to technicians and nurses. However, perverse incentives posed by the payment method have slowed the delegation process for this treatment. Because Medicare recognizes and pays separate charges for assistant surgeons, but not nurses and technicians, ophthalmologists find it more profitable to delegate surgical tasks to assistant surgeons rather than nurses and technicians, whom they would have to pay out of their own pockets. Ophthalmolgist interviews have confirmed that the role of the assistant surgeon could be adequately performed by either a technician or a trained nurse (see Gottlob, et al., 1986).

2.4.3 Identification of Services with Potential for Productivity Gains

Detailed, in-depth studies have identified productivity gains for the services discussed in Section 2.4.2. It is likely that many other services which have not yet received such detailed review have also enjoyed similar productivity gains.

One way of identifying these services is through studies of "overpriced" Medicare procedures. If overpriced services were originally priced perfectly to reflect physician effort, the proportional decrease in physician effort would represent the proportional overpayment. Of course, this is a strong assumption; furthermore, physician effort is difficult to measure, making estimates of overpayment imprecise.

Nevertheless, studies attempting to quantify the amount of overpayment for selected services have identified many of the previously discussed procedures as overpaid. For example, Cromwell, et al. (1987) have identified CABG, one-stage lens procedure, and upper GI endoscopy as overpaid. Colonoscopies, lithotripsy and other cataract surgeries also appeared overpaid, but by a smaller amount. Mitchell et al., (1986) also identified CABGs and cataract surgeries to be overpriced. Finally, Showstack and Schroeder (1981) calculated that gastrointestinal endoscopies are overpaid anywhere from three to six times the actual cost of performing the procedure.

Other services and procedures have been identified as overpaid by these same studies. Some of the most overpaid include transurethral resections of bladder tumors and the prostrate, suprapubic prostatectomy, total hip and knee replacements, decompression of the carpal tunnel, lumbar laminectomy, pacemaker insertions, peripheral iridectomy for glaucoma, biopsy of cervix, vitrectomy, and catheterizations, to name but a few (see Mitchell et al., 1986 and Cromwell, et al., 1987). These may also be services that have been subject to considerable technological and learning curve gains over time, and may warrant the attention of health care insurers.

3.0 VARIATIONS IN PHYSICIAN VISIT PRODUCTIVITY

Physician productivity varies considerably among physicians, even within specialty. Within-specialty productivity differences stem from a variety of factors, as noted in Section 2.0 above. If the range in productivity were narrowed by increasing the efficiency of low-productivity physicians, average costs per procedure or visit would be reduced. This cost reduction could be reflected in a greater productivity offset to the MEI fee update.

Because the focus of this report is on service-specific productivity, we concentrate on a visits-per-hour measure of productivity in this section. Of course, visits-per-hour do not exclusiveley reflect productivity, but may reflect other factors affecting visit length such as casemix. To control for casemix differences, we present all our results by specialty. Within-specialty casemix differences remain uncontrolled for, but are assumed to be small. While the focus of this section is on hourly productivity, we also examine annual productivity and hours worked.

The data used to create these measures were obtained from the HCFA-sponsored Physician Practice Costs and Income Survey conducted by the National Opinion Research Center in 1984 and 1985. Data on the number of visits in the office, hospital (inpatient and outpatient) and nursing home settings, and the number of operations and deliveries in operating rooms were combined to measure total visits or patient contacts. The sum of the number of hours spent on medical activities in these settings and the number of hours spent on administrative activities measures total hours or work effort. Visit and hours data were collected for a random work week in 1984 or 1985 and were then multiplied by the number of weeks worked to obtain annual estimates for each physician. Physicians reporting a non-average work week (say because they were on vacation) were excluded from annual visit and work effort measures to avoid biasing the annual estimates downward; however, since no bias is introduced on an hourly basis, these physicians were included for the hourly productivity analysis. As a result, sample sizes vary between the annual and hourly productivity analyses.

In the following sections, we examine the range in physician productivity. We also examine how sensitive average hourly productivity is to

increased productivity among less productive physicians. Finally, we use descriptive statistics to examine how unproductive physicians differ from productive ones, and to determine ways low-productivity physicians might see more patients per hour.

3.1 Productivity Measures by Specialty

Table 3-1 shows average annual physician productivity in 1984, for nine specialties. The large productivity differences among specialties due to their different visit contents indicate that it is crucial to control for specialty when examining the range in physician productivity. General and family practitioners (GP/FPs) see the most patients per year (7,074) while psychiatrists see the fewest (only 2,438). Visit content differences are also evident in hourly productivity. Psychiatrists spend much more time with patients on average than do primary care specialists, seeing only about one patient per hour. GP/FPs and pediatricians see almost 3 patients per hour (2.7), spending 37 minutes per visit on average. Among surgeons, general surgeons see the fewest patients per hour (1.8) and orthopedic surgeons and ophthalmologists the most (2.4). Differences in visit content do not explain work effort differences, however. Psychiatrists, ophthalmologists, and pediatricians report working the fewest hours per year, while obstetrician/gynecologists (OBGs) report working the most, on average.

To examine the range in physician productivity, we divided physicians into productivity quartiles by specialty. Mean visits per year, hours worked per year, and visits per hour for physicians in low to high quartiles are presented in Table 3-2. The least productive GP/FPs (those in quartile 1) make only 2,928 visits per year compared to 12,358 by the most productive ones in quartile 4 (about a four-fold difference). Variation between the lowest and highest quartiles is enormous for the other specialties as well, on the order of a 3 or 4-fold difference.

The range in work effort is much smaller than in annual visits. For example, there is not even a two-fold difference in work effort between ophthalmologists working the fewest hours per year and those working the most (1597 vs 3128, respectively). Most other specialties show about a two-fold difference, with lowest work effort physicians working 1400 to 1800 hours annually (depending on the specialty) compared to 3,100 to 3,800 hours for the hardest-working physicians.

TABLE 3-1

MEAN PHYSICIAN PRODUCTIVITY BY SPECIALTY

SPECIALTY	Visits Per Year		Hours Per Year		Visits Per Hour	
	N	Mean	N	Mean	N	Mean
General and Family Practitioners	494	7,074	494	2,646	644	2.7
Internists	340	5,555	340	2,589	430	2.1
Pediatricians	201	6,223	201	2,366	277	2.7
General Surgeons	174	4,944	174	2,726	240	1.8
Orthopedists	102	6,422	102	2,806	144	2.4
Ophthamologists	138	5,756	138	2,362	160	2.4
Urologists	129	5,528	129	2,726	169	2.0
Obstetrician/ Gynecologists	177	6,080	177	2,762	263	2.2
Psychiatrists	238	2,438	238	2,183	304	1.1

Source: 1984 HCFA-NORC Physician Practice Costs and Income Survey

On an hourly basis, the range in productivity between the lowest and highest quartiles is similar to that for annual visits. Physicians seeing the fewest patients per hour (quartile 1 in column 3) see about one third the number of patients per hour as those in the highest quartile in almost all specialties. For example, "unproductive" internists see 1.1 patients per hour on average compared to 3.4 seen by productive ones.

The enormous range in physician productivity suggests that significant gains in average productivity are possible through improved efficiency of low productivity physicians. To examine the sensitivity of average hourly productivity to increased efficiency among the least productive physicians, we calculated mean productivity assuming that all physicians in the lowest productivity quartile increased their visits per hour to the 25th percentile level. Table 3-3 shows the "simulated" and actual mean visits per hour, and the percent difference between the two. The simulated means are 4 to 6 percent higher than the actual means. For example, increasing the productivity of the least productive GP/FPs raised the average visits per hour for the specialty as a whole from 2.7 visits to 2.8. This increase is equivalent to all physicians in the specialty spending 1 minute less with each patient. The corresponding 4.5 percent increase in productivity, although modest at the physician level, would translate into considerable savings for the Medicare program if fees were adjusted downwards to reflect increased efficiency.

The larger potential productivity gains for pediatricians and OBGs (6.2 percent and 5.1 percent, respectively) reflects wider ranges in hourly productivity for these specialties. By contrast, urologists show a smaller potential gain from raising the productivity of their bottom quartile physicians (only a 3.7 percent increase).

Our simulated productivity gains are conservative, since we presumed only that the least productive physicians would increase their efficiency to a fairly modest level (the 25th percentile). Nevertheless, significantly reduced costs are possible even through this modest increase in productivity. If the productivity of all physicians below the mean were raised to the mean, to say nothing of raising all physicians to the highest quartile, very substantial productiity gains would be possible. However, some care must be used in interpreting such exercises since there may be legitimate casemix or other differences accounting for the large observed range in physician productivity. We now turn to descriptive analysis of the differences between high and low productivity physicians.

TABLE 3-2

MEAN PHYSICIAN PRODUCTIVITY BY QUARTILE* BY SPECIALTY

	TOTAL VISITS PER YEAR					TOTAL HOURS PER YEAR					TOTAL VISITS PER HOUR				
SPECIALTY	N	1st	2nd	3rd	4th	N	1st	2nd	3rd	4th	N	1st	2nd	3rd	4th
General and Family Practitioners	123	2,928	5,472	7,655	12,358	122	1,706	2,361	2,833	3,687	160	1.3	2.2	2.9	4.4
Internists	85	2,268	4,287	5,861	9,908	84	1,566	2,305	2,869	3,639	107	1.1	1.7	2.3	3.4
Pediatricians	50	2,569	4,982	7,151	10,321	50	1,499	2,107	2,565	3,284	69	1.2	2.3	3.0	4.3
General Surgeons	43	2,305	3,693	5,138	8,651	43	1,786	2,425	2,849	3,824	60	0.9	1.4	2.0	3.1
Orthopedists	25	3,106	5,296	7,054	10,049	25	1,930	2,549	2,939	3,823	36	1.3	2.0	2.5	3.6
Ophthalmologists	34	2,651	4,802	6,333	9,302	34	1,597	2,141	2,549	3,128	40	1.3	2.0	2.6	3.8
Urologists	32	2,342	4,030	6,335	9,778	32	1,791	2,494	2,935	3,663	42	1.0	1.6	2.2	3.3
Obstetrician/ Gynecologists	44	2,553	4,853	6,733	10,098	44	1,745	2,404	2,933	3,939	66	1.1	1.8	2.4	3.4
Psychiatrists	58	1,064	1,776	2,400	4,614	60	1,381	1,917	2,328	3,137	76	0.6	0.9	1.1	1.9

*For each productivity measure, physicians are divided into quartiles from low to high, then means of that variable are calculated for physicians in each quartile.

Source: 1984 HCFA-NORC Physician Practice Costs and Income Survey

TABLE 3-3

POTENTIAL GAINS IN HOURLY PRODUCTIVITY BY SPECIALTY

SPECIALTY	Mean Vists Per Hour		
	Actual	Simulated*	Percent Increase**
General and Family Practictioners	2.7	2.8	4.5%
Internists	2.1	2.2	4.7
Pediatricians	2.7	2.9	6.2
General Surgeons	1.8	1.9	4.0
Orthopedic Surgeons	2.4	2.5	4.9
Ophthalmology	2.4	2.5	4.3
Urologists	2.0	2.1	3.7
Obstetricians/Gynecologists	2.2	2.3	5.1
Psychiatrists	1.1	1.2	4.8

*The visits per hour of all physicians below the 25th percentile of visits per hour are raised to the 25th percentile.

**Percent changes were calculated from actual and simulated means accurate to the second decimal place.

Source: 1984 HCFA-NORC Physician Practice Costs and Income Survey

3.2 Differences Between High and Low Productivity Physicians

The low productivity of physicians seeing few patients per hour may result from inefficient practice organization, underutilization of aides or location in areas with little demand for their services. In this section we examine differences in practice and area characteristics between physicians in the lowest productivity quartile ("unproductive" physicians) and physicians in the highest three quartiles ("productive" physicians) to attempt to identify methods by which low-productivity physicians could become more productive. Although in presenting results by specialty we control for gross casemix differences between productive and unproductive physicians, within-specialty casemix differences are not controlled for. Thus, seemingly "unproductive" physicians may simply be seeing sicker patients that require longer visits.

Table 3-4 shows that low productivity physicians in all specialties use fewer aides than high productivity physicians. For example, the least productive orthopedic surgeons use 3.2 aides per physician on average, compared to an average 4.1 used by more productive orthopedic surgeons. Even among psychiatrists, who use relatively few aides compared to other specialties, unproductive physicians used fewer aides on average than the productive ones (0.7 compared to 1.0, respectively).

In all specialties a greater proportion of productive than unproductive physicians are in the more efficient mid-sized group practices (comprised of 2 to 7 physicians). The differences are largest for general surgeons with 39 percent of productive physicians in mid-sized practices compared to only 22 percent of unproductive ones. Only ophthalmologists and psychiatrists showed little practice size variation between low and high productivity groups.

Differences in employment status between productive and unproductive physicians are less definitive. Productive GP/FPs, pediatricians, ophthalmologists and psychiatrists are slightly more likely to be self-employed than are unproductive physicians in these specialties. However, productive general surgeons, orthopedic surgeons and OBGs are less likely to be self-employed.

Table 3-5 shows differences in area characteristics between productive and unproductive physicians. Presumably physicians in more physician-dense, competitive areas have lower demand and consequently see fewer patients per hour. Indeed, productive physicians tend to be located in less

TABLE 3-4

PRACTICE CHARACTERISTICS FOR "PRODUCTIVE" AND "UNPRODUCTIVE" PHYSICIANS

	Number of Aides		Percent in Mid-Size Groups*		Percent Self-Employed	
	Low	High	Low	High	Low	High
SPECIALTY						
General and Family Practitioners	2.3	3.1	33.9%	41.7%	74.5%	80.8%
Internists	2.3	2.6	27.2	34.2	72.4	73.5
Pediatricians	2.0	3.0	42.4	47.6	58.8	63.9
General Surgeons	1.7	2.3	22.3	38.7	88.6	79.7
Orthopedic Surgeons	3.2	4.1	43.2	56.9	86.2	79.8
Ophthalmologists	2.3	3.9	34.2	36.2	76.0	83.2
Urologists	1.9	2.7	40.0	49.2	81.2	77.2
Obstetricians/ Gynecologists	2.4	3.0	36.4	47.6	84.8	80.8
Psychiatrists	0.7	1.0	15.7	17.4	60.9	69.9

*Two to seven physicians.

Source: 1984 HCFA-NORC Physician Practice Costs and Income Survey.

TABLE 3-5

AREA CHARACTERISTICS OF PRODUCTIVE AND UNPRODUCTIVE PHYSICIANS

	Physician Density*		Percent Urban		Percent in West Region	
	Low	High	Low	High	Low	High
SPECIALTY						
General and Family Practitioners	161	143	76.9%	67.1%	28.9%	23.0%
Internists	236	210	95.4	86.6	28.0	17.5
Pediatricians	237	198	84.9	86.9	20.0	22.4
General Surgeons	185	190	83.7	77.0	36.2	14.5
Orthopedic Surgeons	196	197	86.8	89.7	44.5	21.6
Ophthalmologists	266	200	89.3	84.1	18.4	24.3
Urologists	206	198	85.1	80.8	29.4	19.1
Obstetricians/Gynecologists	200	201	93.1	87.0	26.9	21.3
Psychiatrists	270	244	94.9	93.8	24.7	24.1

*Physician density is measured as the number of physicians per 100,000 population in the physician's county.

Source: 1984 HCFA-NORC Physician Practice Costs and Income Survey

physician-dense areas than unproductive physicians. For example, productive pediatricians are located in areas with 198 physicians per 100,000 population, on average, compared to unproductive ones in areas with 237 physicians per 100,000 population. Most specialties show a similar trend, with the exception of general and orthopedic surgeons and OBGs.

Productive physicians are less likely to be located in urban areas for most specialities, perhaps due to greater physician supply there. This suggests average productivity could be improved if some physicians relocated to rural areas. In addition, unproductive physicians are disproportionately located in the western region, suggesting that average productivity could be enhanced by lower physician supply there.

The differences in practice and area characteristics between productive and unproductive physicians suggest that unproductive physicians can increase the number of patients they see per hour. Most notably, unproductive physicians can use more aides, form mid-sized group practices, and relocate to less physician-dense areas. They can be encouraged to become more productive through a larger productivity offset to the MEI, and hence smaller fee increases.

4.0 IMPLICATIONS OF INCREASED PHYSICIAN SUPPLY FOR MEDICARE PRICES

By law, the Medicare prevailing charge for a physician service in a locality is not to exceed the June 30, 1973 level except to the extent justified on the basis of appropriate indicators of economic change (Federal Register, August 11, 1986). HCFA has taken the "appropriate indicators of economic change" to be increases in physicians' cost of practice, including the value of their own time, as measured by the MEI. However, in a normal, competitive market, prices are not set simply by inflation in costs, but by the interplay of supply and demand. Hence, another "indicator of economic change" HCFA could consider in updating prevailing charges is changes in market supply and demand conditions.

Perhaps the most striking change in supply and demand in the market for physician services in the past 10 to 15 years is the enormous increase in the number of physicians. Table 4-1 shows that the number of physicians has been increasing at a rate of approximately 3.6 percent per year from 1975 to 1986, while the physician to population ratio has been increasing at about 2.7 percent per year. These large increases in supply are expected to continue in the near future. This section discusses the implications of the increase in supply for the prices Medicare should set for physicians' services.

In a competitive market, price is set at the intersection of supply and demand. In Figure 1, the price P_0 is determined by the demand curve D and the supply curve S_0. If supply shifts out to S_1, price falls to P_1. How much price falls is determined by the elasticities (essentially the slopes) of the demand and supply curves. The less elastic (steeper) the demand and supply curves are, the more price will fall when supply increases.

The large increase in the number of physicians shifts the supply curve for physicians' services to the right. If the demand curve is not shifting out as rapidly, the price of physicians' services would fall in a competitive market. The more inelastic supply and demand for physicians' services is, the more price would fall when supply increases.

Medicare is justified in taking into account the large increase in physician supply in updating prevailing charges. With the increased supply, Medicare should be able to buy physicians' services at a lower price. The increased supply is an "economic change" which could be accounted for through a lower MEI update of prevailing charges.

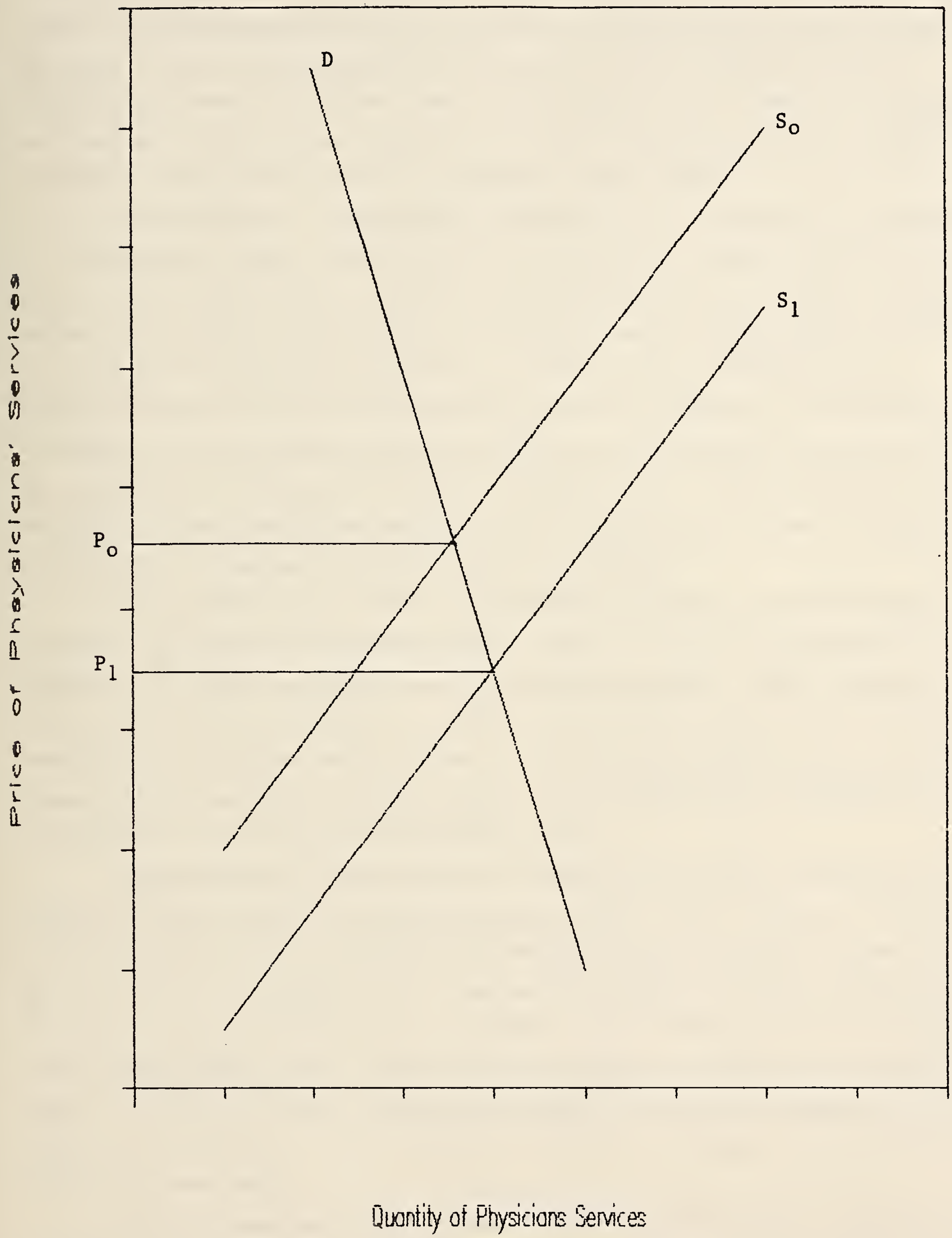
TABLE 4-1

GROWTH IN PHYSICIAN SUPPLY, 1975-1986

YEAR	Number of Physicians	Percent Change	Physicians Per 100,000 Population	Percent Change
1975	366,425	—	170	—
1976	399,500	9.0%	184	8.0%
1977	405,900	1.6	185	0.6
1978	424,400	4.6	191	3.5
1979	440,400	3.8	196	2.6
1980	457,500	3.9	202	3.0
1981	466,600	2.0	203	0.6
1982	481,700	3.2	208	2.2
1983	496,500	3.1	212	2.1
1984	512,100	3.1	217	2.2
1985	527,900	3.1	221	2.1
1986	541,800	2.6	225	1.7
1975-86 average annual percent change		3.6%		2.7%

Source: DHHS, Bureau of Health Professions, Projections of Physician Supply in the U.S., 1985.

FIGURE 1. PRICE DETERMINATION IN THE MARKET FOR PHYSICIANS' SERVICES



Some approximate calculations of how much prices for physicians' services might fall in a competitive market can be made. These are rough, general calculations which may not apply to any particular type of service. Moreover, some of the quantities necessary for the calculations are imperfectly known, so a wide range of uncertainty surrounds the estimates. Nonetheless, they do give some idea of how increasing physician supply should translate into lower prices for procedures and visits.

As noted above, the supply of physicians is increasing by approximately 3.6 percent per year. Demand is also shifting out. Demand may be increasing due to greater population, increased availability of new medical procedures, higher income, and other factors. To begin, assume that demand is shifting out only due to population increase. In this case, the physician to population ratio is a good indicator of how much supply is increasing relative to demand. Over the last decade, physicians per population has been rising at an average of 2.7 percent per year (see Table 4-1). The question to be answered is how much price would fall in a competitive market if supply is increasing 2.7 percent per year relative to demand.

In a competitive market, when supply increases more than demand, price will fall to reequilibrate supply and demand. A fall in price has two effects. It both increases demand and reduces supply, since each physician will supply fewer services at a lower price (unless he is on the backward bending portion of his supply curve). How far price must fall to increase demand and reduce supply so that they are once again equal depends on the elasticities of the supply and demand curves.

Estimated price elasticities of demand for medical services are generally quite small (see Manning et al., 1987, for a review). We will use the elasticity of -0.2 estimated in the RAND Health Insurance Study (Manning et al., 1987). It appears to be the most accurately estimated elasticity and is consistent with other recent estimates (e.g., Wedig, Pope, and Cromwell, 1985; Newhouse and Phelps, 1976). The elasticity of physicians' supply of medical services is known with less confidence, but also appears to be small (Sloan, 1975; Vahovich, 1977; Mitchell, 1984). Assuming a supply elasticity of 0.2 is reasonable.

If the demand and supply elasticities for physicians' services are 0.2, and supply increases by 2.7 percent relative to demand, price must fall by

6.75 percent to equilibrate supply and demand. A 6.75 fall in price increases the demand for physicians' services by (6.75)(0.2) = 1.35 percent. It also reduces supply by (6.75)(0.2) = 1.35 percent. The increase in demand and the drop in supply due to the price decrease bring the market back into equilibrium.

The implication of this analysis is that the price of physician services would rise by 6.75 percent less than the rate of cost inflation in a competitive market due to market conditions. For instance, if the rate of inflation were 10 percent, the price of physicians' services would rise by only 3.25 percent because of the increasing number of physicians. This example shows that since the elasticities of supply and demand of physicians' services are small, market conditions such as rising physician supply would have large effects if the market were competitive.

An important assumption in the preceeding analysis is that growth in demand is equal only to the rate of population growth. In fact, technological advances, new treatment regimes, increased incomes, and the aging of the population are reasons to believe that demand is increasing faster than population growth. Unfortunately, observed increases in demand cannot be used to infer patients' increased willingness to pay for medical services because of insurance coverage, which often reduces the price patients pay for additional medical services to near zero.

Instead, we can simulate how the competitive price would change if true willingness to pay were growing at an assumed rate. Suppose that the demand curve were shifting out at a rate of 2 percent per year above the rate of population growth. At this relatively fast rate of demand growth, the supply of physician services is increasing at only 0.7 percent per year faster than demand. Nevertheless, in a competitive market with demand and supply elasticities of 0.2, price would still decline by 1.75 percent. This price decline increases demand by (1.75)(0.2) = 0.35 percent and reduces supply by (1.75)(0.2) = 0.35 percent, bringing supply and demand back into equality.

These calculations are only illustrative since the rate of growth in patients' willingness to pay is difficult to determine precisely. Still, the calculations indicate that in a competitive market, the large increases in physician supply would be quite likely to lead to reductions in prices, perhaps by a substantial amount. In updating physician fees through the MEI, HCFA could use the major increases in physician supply to argue that it is prudent, cost-effective, and would not impair access to increase fees by less than the rate of inflation in costs because of market conditions.

MEMORANDUM

TO: Terrance Kay, Project Officer

FROM: Gregory C. Pope, CHER

RE: Rescheduling of Physician Productivity Deliverable

DATE: February 3, 1988

From our telephone conversation of February 2, I understand that work on the physician productivity adjustment to the Medicare Economic Index (MEI) has assumed lower priority for HCFA because of Congressionally-mandated MEI updates for the next few years. The physician practice cost work, however, remains a high priority. In order to give highest priority to the practice cost work, it would be helpful, as we discussed, to reschedule the second deliverable for the physician productivity addition to the "Impact of Medicare's Fee Freeze and Participation Agreement on Physicians" grant. This second deliverable will describe the use of an econometric technique, frontier production functions, to estimate potential improvements in physician efficiency. In addition, any necessary revisions in the first physician productivity deliverable will be made. We propose to complete the second deliverable by May 15, 1988

Please let me know if there is any problem with this rescheduling.

WorldCat: Improvements in physician productivity

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